Symbol	Name	Description	Type	Source
π	Pi	Constant dimensionless factor = 3.1415	Numeric	Mathematical constant (given)
a	Tank paint solar absorbence factor	Dimensionless empirical factor which has been established through experience.	Numeric	Reference from Table 12.3-7 in AP42 reference and based on color. Stored in System Library.
D	Tank diameter	Cross sectional linear measurement of the cylindrical tank. Units=linear	Numeric	Client data stored in System Database
H_L	Liquid Height	Average daily tank gauge reading which shows how much is in the tank. Units=linear (e.g. ft)	Numeric	Client data stored in System Database
H_{RO}	Roof Outage	Linear measurement of tank roof height measured from the vertical edge of the tank shell to the top of the dome or coned roof. Units = linear (l)	Numeric	Client data stored in System Database
H_S	Shell Height	Linear measurement of tank height excluding the height of the roof section of the tank. Units = linear (l)	Numeric	Client data stored in System Database
H_{VO}	Vapor Space Outage	The height of the inside tank space minus the liquid level in linear units, e.g. ft	Numeric	Result of Equation 3.1.10
I	Daily solar insolation factor	Empirical factor based on tank materials and conditions. Units = BTU / ft^3 - day	Numeric	Referenced from Table 12.3-6 in AP42 reference. Stored in System Library.
K_E	Vapor space expansion factor	Dimensionless empirical factor used to calculate standing losses in Equation (1)	Numeric	Result of Equation 3.1.7
K_N	Turnover factor	Dimensionless empirical factor	Numeric	Taken from Figure 12.3-6 in AP42 reference. Stored in System Library.
K_P	Working loss product factor	Dimensionless empirical factor which is product specific, i.e. 0.75 for crude oil and 1.0 for all other organic liquids.	Numeric	Included by reference. Stored in System Library.
K_S	Vented Vapor Saturation Factor	Dimensionless factor used to calculate the Standing Storage Losses.	Numeric	Result of Equation 3.1.9

Symbol	Name	Description	Type	Source
L_S	Standing Losses	Hydrocarbon air emissions from crude and condensate above ground storage tanks that are given off while the tank is standing idle (not filling and emptying) and contains some quantity of fluid. Measured in lbs/hr, lbs/day, and tons/year.	Numeric	Result of Equation 3.1.2
L_T	Total losses	Hydrocarbon air emissions from crude and condensate above ground storage tanks that are a sum of the working and standing losses as described above. Measured in lbs/hr, lbs/day, and tons/year.	Numeric	Result of Equation 3.1.1
L_W	Working Losses	Hydrocarbon air emissions from crude and condensate above ground storage tanks that are given off during operations (filling and emptying) and contains some quantity of fluid. Measured in lbs/hr, lbs/day, and tons/year.	Numeric	Result of Equation 3.1.11
Mv	Vapor Molecular Weight	Molecular weight or the weight of an Avogadro's number of molecules of the gases in the vapor space volume. Units = mass/mole (e.g. lb/lb mole)	Numeric	Taken from reference tables in the AP42 reference. Stored in System Library.
P_A	Atmospheric pressure	Standard ambient atmospheric pressure as measured via barometer, e.g. 14.7 psia	Numeric	Constant by reference. Stored in System Library.
dP_B	Breather vent pressure setting range.	The range in pressures at which the tank vent or hatch will relieve under the pressure of its contents.	Numeric	Client data stored in System Database. Otherwise the program will provide a default value if the user chooses.
dPv	Daily vapor pressure range	The range (or change) in the vapor pressure caused by the variance in maximum and minimum daily ambient temperatures. Provided by reference in pressure measurements.	Numeric	Derived from Figure 12.3-1 and Table 12.3-6 in AP42 reference. Stored in System Library.
P_{VA}	Vapor pressure	True vapor pressure of the liquid at the average liquid surface temperature. Units = force / unit area (f/l^2) (lbs/ $inch^2$)	Numeric	Vapor sample data stored in System Database or table in AP42 reference stored in System Library.

$$\sum_{i=1 \text{ to } n} \frac{EF_i\ g}{1\ hp\ hr} \times \frac{\text{Rated } hp_i}{1} \times \frac{24 \text{ hrs}}{\text{day}} \times \frac{365 \text{ days}}{\text{year}} \times \frac{1 \text{ lb}}{453.6 \text{ g}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lbs}} = \frac{\text{Emissions tons}}{\text{year}}$$

Symbol	Name	Description	Type	Source
EF	Emission Factor g/hp/hr	The amount of an individual pollutant that will be generated per horse power hour of operation, e.g. 2.0 grams NOx generated in grams per hp per hour.	Numeric	Provided by the user or obtained from the equipment data base by the id number or model of compressor
HP (hp)	Horse power rating	The power rating of the compressor in horse power per hour	Numeric	Provided by the user or obtained from the equipment data base by the id number or model of compressor

15. The method of claim 14, wherein the primary formula is repeated for each of the following pollutants:

NOx	Nitrous Oxides	Nitrous oxide emissions	Calculated from AP-42 emission factors or manufacturers data.
CO	Carbon Monoxide	Carbon monoxide emissions	Calculated from AP-42 emission factors or manufacturers data.
SO_2	Sulfur dioxide	Sulfur dioxide emissions	Calculated from AP-42 emission factors or manufacturers data.
PA or PM_{10}	Particulates	Particulate emission from fuel combustion	Calculated from AP-42 emission factors or manufacturers data.
VOCnm	Non-methane Volatile Organic Compounds	Measurement of emissions of VOC's as tons per year.	AP-42 emission factors or manufacturers data.

16. The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating hydrocarbon emissions from external combustion units:

$$\sum_{i=1 \text{ to } n} \frac{mmBTU_i}{hr} \times \frac{1\ SCF}{\text{Fuel Heat Value in } BTU} \times \frac{EF\ lbs}{mmSCF} \times \frac{24 \text{ hrs}}{\text{day}} \times \frac{365 \text{ days}}{\text{year}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lbs}} = \frac{\text{Emissions tons}}{\text{year}}$$

Symbol	Name	Description	Type	Source
No. of components, (src)	Number of components	Actual number of each source component at the facility, e.g 355 valves, etc.	Numeric	Provided by the user or obtained from Client data stored in System Database or equipment data stored in System Library
VOC%	VOC Concentration in the affected stream	The concentration of VOC (volatile organic hydrocarbon compounds) defined as any compound with C3+ hydrocarbons as identified in the gas analysis and as calculated by volume %.	Numeric	Calculated from the gas analysis for this facility.

20. The method of claim 18, wherein the mathematical database includes the primary calculation formula for calculating emissions for glycol dehydration units, wherein:

Symbol	Name	Description	Type	Source
	Unit Description	Case name and case description used to retrieve case files from the GRI program. This name will also be identified by a facility ID number and an equipment ID number.	Text	Provided by the user or taken from the facility data base as a facility name.
	Annual Hours of Operation	Number of hours the unit operates annually, e.g 8760 hrs = 1 year	Numeric	Input by user or user data base.
	Gas Composition	Percentages of all components in the gas stream. Individual values input separately from gas analysis.	Numeric and text	Gas analysis provided by user or from Client data stored in System Database
mmscf / day	Dry gas flow rate	The volumetric flow of the sales gas stream in volumetric units per day (e.g. mmscf/day or million standard cubic feet per day)	Numeric	Production data from user or Client data stored in System Database
lb / mmwscf	Dry gas water content	The target final concentration of water in the sales gas stream, in the USA the default value is 7.0 lb / mmscf	Numeric	Client data stored in System Database or accepted by default
	Absorber stages	Number of actual equilibrium stages in the contactor; may be chosen, if known, by the user as an alternative entry to the dry gas water content described above.	Numeric	Chosen by user

Symbol	Name	Description	Type	Source
T_{gas}	Gas temperature at the separator	The measured temperature of the gas stream in the separator	Numeric	Measured at the field location by the user.
P_{sep}	Separator Pressure	The operating pressure of the separator measured in psig	Numeric	Measured at the field location by the user.
psig	Pounds per square inch gauge	Pressure measurement in units of pounds per square inch or in general units - f/l^2.	Numeric	Measured with a pressure measuring device at the equipment site.
°API	Degrees API gravity	The measured API gravity of the fluid (crude) being measured as calculated by a standard equation which ratios the specific gravity of the fluid to a referenced standard.	Numeric	Calculated using the physical data of the fluid.
°F	Degrees Fahrenheit	The standard temperature measurement using degrees Fahrenheit as a scale.	Numeric	Standard unit
log	Logarithm	Mathematical relationship which equals the exponent value that the number 10 would be raised to get that same number.	Text	Standard unit

22. The method of claim 12, wherein the mathematical database includes the following primary calculation formulas for calculating loading loss emissions:

$$L_L = 12.46\frac{SPM}{T}$$

Symbol	Name	Description	Type	Source
L_L	Loading losses - VOC	The Volatile Organic Compound (VOC) emissions quantity as determined in the above equation.	Numeric	Result of equation 3.7.1
S	Saturation factor	Empirical quantity for calculation	Numeric	AP-42 reference Table 5.2-1. Stored in System Library.
P	True liquid vapor pressure of the liquid being loaded	The true vapor pressure of the liquid being loaded which is the pressure at which the liquid is in equilibrium with the overhead vapors. Measured in pounds per square inch atmospheric (psia)	Numeric	By reference from AP-42 Figures 7.1-5, 7.1-6, 7.1-2. Stored in System Library.